

2016

J.M. Stuart Station Ash Pond 3A Annual Inspection

ODNR File No.: 8535-012

The Dayton Power & Light Company



2014

**Prepared by:
John Hendrix, PE
The Dayton Power & Light Company**

Date: December 21, 2016

Purpose

I have conducted the following annual inspection in compliance of the Federal CCR Rule, 40 CFR Part 257 and Ohio Department of Natural Resources ORC 1501.062.

Statement of Qualifications

I am a practicing Civil/Geotechnical Engineer registered with the State of Ohio employed by the Dayton Power & Light Company. I am experienced in the design, maintenance and operation of earthen dams and impoundments.

Review of Impoundment Documentation [§ 257.83(b)(1)(i)]

Design, History, and Operation of the Facility

Ash Pond 3A is an upland reservoir that was designed by Bowser Mourner and constructed in c1978 under ODNR Permit No. 77-97. A portion of this pond is constructed over the previously closed Pond 3 which was capped with two feet of cohesive material. In 2010-11 a new liner was installed in the bottom consisting of two feet of 10^{-7} clay. The dam is constructed with a solid clay core. A sand curtain drain was installed along the toe of the south dam to alleviate water in Pond 3 below this structure as indicated in drawing 300-46-1109. The pond has an area of 52.7 acres at the crest, is 26-feet deep and has a volume of 1,257 acre-feet (427 million gallons) to the crest.

The inlets for this pond are five high-density polyethylene (HDPE) pipes entering the pond typically in the southwest corner. Sluice lines are moved as the pond fills with solids. The Maximum Operating Level of this pond is three feet below the crest. The outlet is a concrete structure with removable stop logs to control the level and facilitate dewatering the pond for cleaning. Effluent is conveyed from this structure to Pond 6 through a 30-inch reinforced concrete pipe.

In 2012 after refilling the pond with water, seepage was noted at the toe of the south dam near the western end. The pond was then dewatered and an investigation was conducted which found that the clay liner had been compromised. The liner was reinstalled to the original configuration.

This pond is used for settling wet sluiced fly ash produced from the combustion of coal in the generating units. When the pond nears the intended volume of CCR, flow is transferred to another pond and this pond is dewatered. After dewatering, the ash is excavated and hauled to an onsite ash landfill.

Periodic Inspections

A thorough review of 2016 weekly facility inspections was conducted. Weekly inspections do not indicate any structural weakness or concerns. Previous inspections from Civil Environmental Consultants in 2009 and Ohio Department of Natural Resources Dam Safety Division in 2013 were also reviewed.

Previous Structural Assessments

Structural assessments from previous years reviewed were Ponds 3A, 5, 6 & 7 Slope Stability Investigation, BBC&M, 2010, and Pond 3A Initial Periodic Structural Stability Assessment prepared by Haley & Aldrich, 2016.

Visual Inspection of Impoundment [§ 257.83(b)(1)(ii)]

The Pond 3A dam is in good structural condition based on the visual inspection and review of other assessments performed by BBC&M and Haley and Aldrich. Minor maintenance items were noted which can be found in Appendix D.

At the time of inspection this pond was dewatered and in the excavation cycle. Excavation of dewatered ash had progressed since the previous inspection and again was halted for the season and ash was treated to prevent wind erosion. Little water was present.

Changes in Geometry [§ 257.83(b)(2)(i)]

There were no changes to the geometry of the downstream face of the dam pond or other indications of structural weakness.

There were no changes to the upstream face of the dam. Rock erosion protection is in place and in good condition.

Instrumentation [§ 257.83(b)(2)(ii)]

Pond 3A is equipped with a staff gauge. At the time of inspection the pond was empty of water and had no reading on the staff gauge. No previous documented readings were available for this instrument.

Structural Weakness [§ 257.83(b)(2)(vi)]

No indication was found of an actual or potential structural weakness of the CCR unit or any existing condition that was disrupting or had the potential to disrupt the operation and safety of the CCR unit and appurtenant structures.

Other Changes [§ 257.83(b)(2)(vii)]

No changes were found to the CCR unit which could affect the stability or operation of the impounding structure since the previous annual inspection.

Visual Inspection of Hydraulic Structures [§ 257.83(b)(1)(iii)]

The hydraulic structures for this pond consist of a vertical concrete structure with removable stop logs (large C channels) with a reinforced concrete pipe passing through the earthen dam. Spalling of concrete of the vertical riser observed in 2015 had not increased and does not impact structural integrity or serviceability of the structure.

No other conduits pass through the impoundment, dam or under the impoundment.

Water and Material Depths and Volumes

[§ 257.83(b)(2)(iii), § 257.83(b)(2)(iv), § 257.83(b)(2)(v)]

Physical Parameters of Impoundment		
Depth of water	0	Feet
Min. depth of water	0	Feet
Max. depth of water	2	Feet
Elevation of water	N.A.	Feet
Storage Capacity	2,200,000	Cubic Yards, Crest Full Volume
Volume of water	>100	Cubic Yards
Volume of CCR	435,000	Cubic Yards

Appendix A

CCR Rule Requirements for Impoundment Annual Inspections

§257.83 Inspection requirements for CCR surface impoundments.

(a) *Inspections by a qualified person.*

- (1) All CCR surface impoundments and any lateral expansion of a CCR surface impoundment must be examined by a qualified person as follows:
 - (i) At intervals not exceeding seven days, inspect for any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit;
 - (ii) At intervals not exceeding seven days, inspect the discharge of all outlets of hydraulic structures which pass underneath the base of the surface impoundment or through the dike of the CCR unit for abnormal discoloration, flow or discharge of debris or sediment; and
 - (iii) At intervals not exceeding 30 days, monitor all CCR unit instrumentation.
- (2) The results of the inspection by a qualified person must be recorded in the facility's operating record as required by §257.105(g)(5).
 - (i) *(2) Timeframes for inspections by a qualified person—(i) Existing CCR surface impoundments.* The owner or operator of the CCR unit must initiate the inspections required under paragraph (a) of this section no later than October 19, 2015.
 - (ii) *New CCR surface impoundments and any lateral expansion of a CCR surface impoundment.* The owner or operator of the CCR unit must initiate the inspections required under paragraph (a) of this section upon initial receipt of CCR by the CCR unit.

(b) *Annual inspections by a qualified professional engineer.*

- (1) If the existing or new CCR surface impoundment or any lateral expansion of the CCR surface impoundment is subject to the periodic structural stability assessment requirements under §257.73(d) or §257.74(d), the CCR unit must additionally be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection must, at a minimum, include:
 - (i) A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., CCR unit design and construction information required by §§257.73(c)(1) and 257.74(c)(1), previous periodic structural stability assessments required under §§257.73(d) and 257.74(d), the results of inspections by a qualified person, and results of previous annual inspections);
 - (ii) A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures; and
 - (iii) A visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation.
- (2) *Inspection report.* The qualified professional engineer must prepare a report following each inspection that addresses the following:
 - (i) Any changes in geometry of the impounding structure since the previous annual inspection;
 - (ii) The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection;
 - (iii) The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection;
 - (iv) The storage capacity of the impounding structure at the time of the inspection;
 - (v) The approximate volume of the impounded water and CCR at the time of the inspection;
 - (vi) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures; and
 - (vii) Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.
- (3) *Timeframes for conducting the initial inspection—*

- (i) *Existing CCR surface impoundments.* The owner or operator of the CCR unit must complete the initial inspection required by paragraphs (b)(1) and (2) of this section no later than January 19, 2016.
 - (ii) *New CCR surface impoundments and any lateral expansion of a CCR surface impoundment.* The owner or operator of the CCR unit must complete the initial annual inspection required by paragraphs (b)(1) and (2) of this section is completed no later than 14 months following the date of initial receipt of CCR in the CCR unit.
- (4) *Frequency of inspections.*
- (i) Except as provided for in paragraph (b)(4)(ii) of this section, the owner or operator of the CCR unit must conduct the inspection required by paragraphs (b)(1) and (2) of this section on an annual basis. The date of completing the initial inspection report is the basis for establishing the deadline to complete the first subsequent inspection. Any required inspection may be conducted prior to the required deadline provided the owner or operator places the completed inspection report into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing subsequent inspection reports is based on the date of completing the previous inspection report. For purposes of this section, the owner or operator has completed an inspection when the inspection report has been placed in the facility's operating record as required by §257.105(g)(6).
 - (ii) (ii) In any calendar year in which both the periodic inspection by a qualified professional engineer and the quinquennial (occurring every five years) structural stability assessment by a qualified professional engineer required by §§257.73(d) and 257.74(d) are required to be completed, the annual inspection is not required, provided the structural stability assessment is completed during the calendar year. If the annual inspection is not conducted in a year as provided by this paragraph (b)(4)(ii), the deadline for completing the next annual inspection is one year from the date of completing the quinquennial structural stability assessment.
- (5) If a deficiency or release is identified during an inspection, the owner or operator must remedy the deficiency or release as soon as feasible and prepare documentation detailing the corrective measures taken.
- (c) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in §257.105(g), the notification requirements specified in §257.106(g), and the internet requirements specified in §257.107(g).

[80 FR 21468, Apr. 17, 2015, as amended at 80 FR 37992, July 2, 2015]

Appendix B

Reference Documents Reviewed

- ❖ Operation Maintenance and Inspection Manual
- ❖ Emergency Action Plan
- ❖ Ponds 3A, 5, 6 & 7 Slope Stability Investigation, BBC&M, 2010
- ❖ Pond 3A Initial Periodic Structural Stability Assessment, Haley & Aldrich, 2016
- ❖ Previous inspections reports
 - CEC 2009
 - ODNR 2009, 2013
 - CHA 2010
 - DP&L 2015
- ❖ Drawings
 - 300-12-1020
 - 300-12-1020B
 - 300-46-1109
 - 300-46-1158

Appendix C
Inspection Check List

Dam Field Inspection Report

DAM/IMPOUNDMENT ANNUAL FIELD INSPECTION FORM

Unit Name: Pond 3A

Facility Name: J.M. Stuart Station

ODNR File No.: 8535-012

CCR Unit

ODNR Hazard Classification: I II III IV N/A

Impoundment Type: Incised Upland Lake

Description:

Inspection Date(s): December 2016

Weather/Surface Conditions During Inspection: mostly cool and dry.

Freeboard: Pond was dewatered for excavation.

ACTION

NONE	MONITOR	MAINTENANCE	ENGINEER
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UPSTREAM SLOPE Gradient: Horizontal: 2.5 Vertical: 1 (est. meas.)

VEGETATION

Trees:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
Brush:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
Ground Cover:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Grass from top of stone shoreline protection and crest.				
CONDITION: good				

SLOPE PROTECTION

TYPE or NONE: Stone	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Gabion stone generally ranging from 3 inches to 7 inches				
CONDITION: good				

EROSION:

DESCRIPTION AND LOCATION: minor rills were observed on the east and west upstream slope below the rock protection.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)

SLIDES/SLOUGHS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
CRACKS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
BULGES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
OTHER	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				

OTHER (rodent burrows, ruts, etc.)

DESCRIPTION AND LOCATION:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CREST Length: 14,009.6' Width: 10' (est. meas.)

GROUND COVER:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Grass cover on east and south sides. Stone cover on north and west sides.				
CONDITION: Good				

EROSION

DESCRIPTION AND LOCATION:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)

CRACKS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
RUTS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

		ACTION			
		NONE	MONITOR	MAINTENANCE	ENGINEER
DESCRIPTION AND LOCATION:	Small ruts noted in the previous inspection had been repaired.				
POT HOLES:		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:					
OTHER		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:					
MONITORING INSTRUMENTATION:		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION:	Staff gauge mounted to outlet structure.				
CONDITION:	Good Condition				
ALIGNMENT:					
CONDITION:	Alignment of dam indicates no deflection horizontally or vertically.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OTHER (rodent burrows, ruts, etc.)					
DESCRIPTION AND LOCATION:		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DOWNSTREAM SLOPE Gradient: Horizontal: 2.5 Vertical: 1 (est. meas.)					
VEGETATION					
Trees:		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	Small trees noted in the previous inspection had been removed.				
Brush:		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:					
Ground Cover:		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION:	Grass				
CONDITION:	Grass cover was well maintained on the south and east dam. Grass on the west dam was cut but not as well maintained.				
EROSION		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:					
INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)					
SLIDES/SLOUGHS:		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:					
CRACKS:		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:					
BULGES		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:					
OTHER		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:					
SEEPAGE/WET AREA		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:					
EMBANKMENT DRAINS:		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION:	None present.				
CONDITION:					
MONITORING INSTRUMENTATION:		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION:					
CONDITION:					
OTHER (rodent burrows, ruts, etc.)					
DESCRIPTION AND LOCATION:	Rodent burrows noted in 2015 had been filled.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ACTION

- NONE
- MONITOR
- MAINTENANCE
- ENGINEER

DESCRIPTION AND LOCATION:

DESCRIPTION AND LOCATION:

HYDRAULIC STRUCTURES

STRUCTURE:

DESCRIPTION: Principle/Emergency Spillway

INLET

-
-
-
-

DESCRIPTION: Concrete structure with removeable steel channel stop logs used to maintain water level during operation.

CONDITION: structure is in good condition with only minor spalling near the water normal operating level

OBSTRUCTION NOTED: (YES NO) DESCRIBE IF YES:

CONDUIT

-
-
-
-

DESCRIPTION: 24 inch reinforced concrete pipe

CONDITION: pipe is in good condition with exception of some damage at the end of the pipe potentially caused by excavating equipment.

SEEPAGE NOTED: (YES NO) DESCRIBE IF YES:

OUTLET

-
-
-
-

DESCRIPTION: Pipe discharges into a pool at the west end of Pond 6.

CONDITION: Good

EROSION NOTED: (YES NO) DESCRIBE IF YES:

Appendix D

CCR Unit Maintenance Recommendations

1. Continue mowing and monitoring of vegetation.

Continued Monitoring

1. Monitor outlet pipe for potential erosion after pond is returned to operation.
2. Monitor slopes below shoreline protection for erosion. Repair before refilling if necessary.